of future experimental evaluation of post-MI smoking cessation interventions.

Moving on from the patient with established cardiovascular disease to people classified as "at risk," it is found that a number of large controlled trials of risk reduction have demonstrated that counseling on individual specific risk factors and exposure to smoking cessation techniques can be effective. These trials have been discussed in detail in the 1983 Report of the Surgeon General *The Health Consequences of Smoking* (USDHHS 1983). Rose and Hamilton and their colleagues (Rose 1977; Rose and Hamilton 1978; Rose et al. 1982) have found higher abstinence levels in a group given intense advice and education as compared with a control group. The Multiple Risk Intervention Trial (MRFIT) (Ockene et al. 1982b), with 12,866 high risk men, reported 40 percent abstinence in the special intervention group and 21 percent in the usual care group. Similar results were found in Britain (Rose et al. 1980) as part of the WHO multifactorial trial (WHO European Collaborative Group 1982). Other smaller scale studies have generally found that high risk men are susceptible to risk-reduction interventions (Cooper et al. 1982; Malotte et al. 1981; Powell and Arnold 1982). For the most part, these studies have been well designed and many have included objective validation of verbal reports.

The Use of Nicotine Chewing Gum

A pharmacological aid to smoking cessation designed to decrease the smoker's desire for nicotine and to relieve withdrawal symptoms has recently become available as a prescription product in the United States after development in Europe; current information and research has been summarized (Grabowski and Hall, in press; Hughes and Miller, unpublished manuscript). The new aid is a chewing gum containing 2 mg nicotine bound to an ion exchange resin for controlled release and buffered for rapid absorption through the buccal mucosa. Compared with the rapid elevation of blood nicotine levels achieved after smoking a cigarette, peak blood levels with 2 mg gum are lower and are achieved more slowly (Russell et al. 1976a; McNabb et al. 1982). Although blood levels may peak within minutes following smoking, peak levels occur after 20 to 30 minutes of chewing the gum, presumably not reproducing the pleasure of smoking because of the slower, nonbolus release of nicotine (Russell et al. 1980). Nicotine chewing gum is indicated as a temporary aid to the cigarette smoker seeking to give up his or her smoking habit while participating in a behavioral modification program under medical supervision. The efficacy of nicotine chewing gum use without concomitant participation in a behavioral modification program has not been established. Thus, nicotine gum could aid

in the cessation process by allowing the smoker to break the smoking habit with abrupt cigarette cessation, while gradually withdrawing from nicotine. In controlled studies, evidence has been offered that nicotine gum can relieve withdrawal symptoms (Jarvis et al. 1982; Schneider and Jarvik 1984; Schneider et al. 1983; Hughes et al. 1984; West et al. 1984).

According to Hughes and Miller (unpublished manuscript), contraindications include recent MIs or life-threatening arrythmias, severe or worsening angina, or active temporomandibular joint disease. Nicotine may aggravate coronary heart disease, vasospastic diseases, hypertension, diabetes, and hyperthyroidism. Because nicotine is swallowed during use of the gum, people with peptic ulcer or esophagitis may be particularly at risk. These contraindications are based on known or presumed relationships between nicotine and these conditions, and not upon direct tests of nicotine gum use. Women who are pregnant or nursing should also avoid gum use because nicotine decreases fetal breathing movements and is secreted in maternal milk (USDHHS 1980).

Common side effects of use include air swallowing, belching, jaw ache, sore mouth or throat, upset stomach, hiccups, nausea, and mouth ulceration (Fagerstrom 1982; Jarvis et al. 1982; Russell et al. 1980; Schneider et al. 1983). Most side effects can be diminished by proper instruction on mode of chewing. The percentage of subjects who may become dependent upon gum use is not well known. In two studies, 3 to 7 percent of all subjects were considered dependent by the investigators (Jarvis et al. 1982; Raw et al. 1980).

Given that nicotine gum does appear to alleviate withdrawal symptoms, to what extent has it been efficacious in cessation? Early studies of cessation were confounded by allowing smokers to simultaneously smoke and chew the gum (Brantmark et al. 1973; Puska et al. 1979; Russell et al. 1976b). More recently, controlled clinic-support studies have shown enhancement of both short- and long-term success rates with nicotine gum (Fagerstrom 1982; Jarvis et al. 1982; Schneider et al. 1983). Success has been attributed to an interaction between the active gum and the support systems in ways not yet understood. Schneider et al. (1983) compared nicotine and placebo gum in both dispensary and clinic settings. There was no effect of active gum in the dispensary setting; subjects chewed the gum for a very short time period and resumed smoking quickly. In the clinic conditions, the nicotine gum produced significantly higher success rates than placebo, with a peak difference achieved at 6 months (48 percent versus 20 percent). In other studies with followups of from 3 to 12 months, cessation rates were higher for groups receiving active gum than for placebo gum groups or groups receiving other treatments (Fee and Stewart 1982; Hjalmarson 1983; Jarvis 1983; Malcolm et al. 1980; Raw et al. 1980). Fagerstrom's

(1982) work suggests that highly nicotine-dependent smokers may be the best candidates for gum use.

Studies conducted in physicians' offices have produced mixed results. In a study using over 1,500 patients with smoking-related diseases attending a hospital or chest clinic, there was no reported superiority of nicotine gum compared with several conditions involving usual physician advice to quit and a booklet (British Thoracic Society 1983). Overall, 9.7 percent of patients were abstinent at 1 year, but approximately one-fourth of patients claiming abstinence had carboxyhemoglobin and plasma thiocyanate concentrations typical of smokers. This study has been criticized for the manner in which the gum was administered to the patients (Jarvis and Russell 1983). On the other hand, Fagerstrom (1983) found nicotine gum use to be statistically superior to a no-gum condition at 1-year followup in a 13-physician study involving 145 patients. Similarly, Russell and his colleagues (Russell et al. 1983a,b), in a well-designed study involving 1,938 general practice patients, observed a difference for the same time period. Success rates in the nicotine gum plus advice group were about double those in the nonintervention and advice-only groups (8.8 percent versus 4 percent not smoking at 4 months and at 1 year). These results are based on all smokers who saw their physician regardless of desire to quit. The higher success rate of the group offered the nicotine gum was achieved even though only 53 percent tried the gum. The self-selected subgroup who used more than one box of gum (105 pieces) had an adjusted long-term success rate of 24 percent.

Reasons for the inconsistent results may relate to differences in (1) instructions on gum use given to the patient, (2) distribution of the gum (whether it was provided directly to the patient or offered in the form of a prescription), (3) patient personality characteristics or motivation for smoking, (4) support or followup in addition to providing the gum, and (5) sample sizes and duration of followup. The first four of these factors can all affect compliance, which is deemed critical for effective use of the gum in physician practice. Key questions remaining to be systematically tested relate to what constitutes optimal gum use, such as dose, frequency, and duration (Schneider et al. 1983). Future research should resolve the general usefulness of this pharmacologic treatment as well as the appropriate adjunct treatment strategies.

Discussion and Synthesis

Methodological Considerations

There is marked variation in the methodology and presentation of results from the studies included in this review, posing problems for comparison. To begin with, interventions are not always well

specified, making it difficult to categorize or to evaluate any given technique. This is particularly true in studies in which the intervention consisted of a very brief warning to quit delivered in the physician's own style. Any accompanying written material is often only vaguely described. There are, of course, studies in which interventions are well detailed, such as the MRFIT trial (Ockene et al. 1982b). In this relatively new area of smoking cessation research, it is particularly important to researchers to report as much detail as possible on their intervention and control methods.

In evaluating the success of interventions, standard definitions of outcome need to be agreed upon. These include total abstinence from tobacco use, not just cessation of cigarette smoking or reduction in total amount smoked. If multiple measures are preferred, abstinence should always be reported. Objective validation of self-report is critically important, especially when at-risk or patently ill patients may be biased to report abstinence. Followup periods should optimally be at least 1 year. When subjects are lost to followup, the method of calculating success rates should be clearly specified. For example, the most conservative criterion would dictate classifying as smokers subjects who refuse measurement. Other problems may include incomplete data because of nonsurvivors, especially in medical populations. If results are based only on those successfully followed, as much information on lost subjects as is possible should be provided. In retrospective studies, memory bias may also influence results. Other problems common to smoking cessation research include inadequate sample sizes, which reduce statistical power; lack of comparison or control groups; and the failure to select an appropriate design, such as randomization or a quasi-experimental model. Design, methodology, and interpretation issues in smoking research have been treated in other sources in greater detail (Pederson 1982; USDHEW 1979; USDHHS 1982, 1983).

Trends in the Literature

When considering quit rates among the various patient groups discussed in this review, it is important to keep two considerations in mind. First, quit rates can vary as a function of the type of intervention, not only by patient group. For example, the highest quit rate among controlled pregnancy interventions (Sexton and Hebel 1984) was found in the study with the largest subject sample and strongest design, and consisted of a multiple contact intervention. Second, of the four classes of patient considered, persons with pulmonary and cardiac disease differ qualitatively from general practice and pregnant patients. The first two categories of patients have diseases directly related to their smoking behavior; risks and consequences of continued smoking can be personalized and detailed. On the other hand, general practice patients may not be coming in

for a problem directly related to their smoking. Battista (1983) reported that antismoking counseling was delivered by 99 percent of primary care physicians in his survey sample when the reason for the medical visit was related to smoking, but by only 52 percent when the medical problem was unrelated and a mere 11 percent when the visit was for a minor problem. Finally, pregnant patients seen routinely for prenatal care are usually not ill, and may have difficulty personalizing the risks to the fetus and to themselves, especially if they have smoked through previous pregnancies and borne healthy babies.

Notwithstanding these limitations, some trends are evident in the literature: the quit rates in recent research appear lower than in older studies, and a positive association between severity of disease and quit rate can be noted. There are exceptions to these generalizations, but the intention in presenting them is to bring some order to the results.

The series of studies examining quit rates among pulmonary patients indicate a decrease in success over time, with more recent studies reporting lower rates. The same general trend appears among post-MI patient groups when data from groups receiving treatment in addition to physician advice are excluded. This apparent decline in effectiveness may be attributable to higher spontaneous quit rates in the population of smokers. Because more people are quitting on their own, fewer current smokers and more ex-smokers are presenting themselves to physicians. Included in the group of ex-smokers are those who a decade or two ago would have stopped on the advice of their physician, but who have quit because of media educational campaigns. Physicians specializing in pulmonary or cardiac disease are then left to deal with the more recalcitrant, hard-core group. In addition, current patients may be more honest in reporting failure to quit, and there are measures for objectively verifying verbal reports (e.g., expired air carbon monoxide, carboxyhemoglobin, saliva or blood thiocyanate, saliva or blood cotinine).

Although there are comparatively few studies with general practice patients and pregnant women, these two groups show fairly low abstinence rates. As mentioned above, when attending for routine visits, these patients are generally healthier than those with chronic pulmonary disease or cardiac disease. They are also less likely to be visiting the physician for an illness related to smoking. When treated with a powerful intervention, however, high cessation rates (over 40 percent) have been reported (Sexton and Hebel 1984). The quit rates among patients with pulmonary disease vary from 12.5 to 76 percent. The highest rates are found in studies including patients who have ever smoked in the past, as well as those who are smoking at the time of treatment (Daughton et al. 1980; Dudley et al.

1977; Mausner 1970). When these studies are excluded, the between-study rates cluster more closely between 20 and 40 percent. In general, it appears that patients with MI, especially those receiving strong advice, are much more likely to quit smoking than are other patient groups, with 40 to 50 percent abstinence levels being the rule rather than the exception. This finding matches the most successful behavioral interventions reported in the general smoking cessation literature—those programs with strong maintenance as well as cessation components (USDHHS 1982). The potential effect of continued smoking on future health status for cardiac patients has an immediacy that appears to motivate positive action. Six studies investigating severity of diagnosis (Baile et al. 1982; Campbell et al. 1983; Dudley et al. 1977; Mausner et al. 1970; Sillett et al. 1978; Wilhelmsson et al. 1975) support this relationship; one does not (Weinblatt et al. 1971). It is possible that the health benefits of cessation have been underestimated to date, if the most severely ill patients are the most likely to quit.

Although this discussion implies a causal relationship between severity of disease and compliance, other explanations are possible. Factors such as personality characteristics that are differentially related to diagnosis and ease of quitting may influence results. In addition, physician involvement may be much more intense with patients who have more severe diagnoses and may be causally related to differential outcome.

Patient Variables Related to Abstinence

There have been a number of attempts to relate variables to successful quitting among patient groups. The underlying rationale of these attempts can be conceived as a search for possible causal factors. Multivariate statistical procedures have been used to generate predictive models, which may serve as the basis for theorizing about mechanics involved in explaining why some patients quit smoking and others do not. The results with respiratory patients of Dudley et al. (1977) and Pederson and her colleagues (Pederson et al. 1980, 1982; Pederson and Baskerville 1983) were described earlier. Examining the psychological and behavioral variables, the retrospective study of Dudley et al. (1977) identified good adjustment variables as predictors of success, and the prospective studies (Pederson et al. 1982; Pederson and Baskerville 1983) found that prediction of quitting and desire for quitting were positively associated with success, but addiction was negatively associated. In the MRFIT program (Ockene et al. 1982a), men at high risk for CHD who were classified as Continuing Successes (stopped smoking and maintained abstinence) were characterized as having, in combination (and in decreasing order of importance), a high expectation of success, few cigarettes smoked upon entry, low stress,

ease of prior cessation attempts, a long period of prior abstinence, and a high degree of personal security. Together, the combination of high stress and low psychosocial assets acted as barriers to long-term smoking cessation, characterizing the "problem smokers" (the combined group of nonstoppers and recidivists). The congruency of these findings suggests the need to "develop systematic and convenient ways to collect and use data regarding a participant's experiences of stress and psychological assets," according to Ockene et al. (1982a, p. 26). As studies of self-attribution of change related to positive outcome (self-efficacy) in smoking ceesation have shown (USDHHS 1982), these and related psychosocial variables may be critical predictors for all persons attempting smoking cessation. Thus, this approach should be expanded and tested on other patient populations.

Physician Variables Related to Effectiveness

Success rates in physician intervention studies have been shown to vary as a function of the participating physicians as well as of the interventions they employ (Ewart et al. 1983; Pincherle and Wright 1970; Rose and Hamilton 1978; Russell et al. 1979). While most smoking cessation studies using behavior modification techniques attempt to standardize the intervention and to eliminate differences among those delivering it, physician intervention studies often involve advice delivered in the doctor's own style and hope to capitalize on the personal interaction with the patient, e.g., Russell et al. (1979). As this stage of research it is sometimes difficult to separate out the various factors contributing to the degree of success of a particular intervention.

Both types of intervention and physician factors were found to be important in determining success rates in two studies reported by Ewart et al. (1983), using two very different patient populations, asbestos-exposed shipyard workers (n=871) and low-income women attending family planning clinics (n=1,179). Physicians saw all patients only once; assignment to group was random in the shipyard study and controlled by clinic in the family planning population (quasi-experimental design). In both studies, the more detailed advice effort consisted of a physician's warning to stop smoking with up to 5 minutes of individually focused cessation counseling. The comparison technique consisted of a simple warning by the physician (shipyard workers) or viewing an educational film (low-income women). Cessation rates at 1 year in the detailed advice group were double those in the comparison group in both studies. Mean quit rates were not reported, but variability in physician success was examined. In the shipyard study, success rates were defined as the proportion of patients counseled by the physician who quit smoking

within 3 months. Among the four participating physicians, success rates ranged from 6 to 14 percent at the 1-year followup.

Success rates were examined by types of patients assigned to each physician and by differences in physician behavior. Patient characteristics did not explain the variable rates of success between different physicians. These included medical symptoms, demographics, physiological characteristics, and a number of behavioral variables that have been found to predict smoking cessation (number of cigarettes smoked daily, motivation to quit, and length of past nonsmoking periods). On the other hand, physician motivation and effort in patient counseling emerged as important factors. When physician success rates were examined as a function of time since the continuing medical education (CME) training program over a 9-month period, all physicians were shown to become less effective as time passed, but two of the four had dramatic drop-offs in effectiveness. Declining rates of success were associated with lack of compliance with the protocol by failing to have the patient select a target date for quitting smoking. (Both patient and physician had been asked specifically about this in an exit interview. The proportion of patients who reported agreeing on such a target date was treated as an indirect marker of compliance.) Target date setting in noncompliant physicians decreased from 23 percent of patients counseled in the first 3-month period to 3 percent in the final 3-month period, with a concomitant decrease in success from 15 to 2.0 percent. In comparison, the two more successful physicians set target dates with 57 and 49 percent of their patients in the first and final 3-month study periods, and achieved 15 and 9 percent success rates, respectively. Furthermore, with the passage of time, the two less compliant physicians altered their pattern of target date setting with patients, providing such advice to many fewer lighter smokers (under 20 cigarettes per day) but maintaining the rate of advice with heavier smokers. The authors interpreted this as a selective shift of effort, but it can be seen also as a simple diminution of effort with the former group of patients because the proportion of heavy smokers advised did not actually increase over time.

In the family planning clinic study, maintenance of physician performance was influenced by a feedback intervention. Performance was monitored by asking patients who had just seen the physician whether they had been counseled to quit smoking; when the percentage of patients reporting advice declined, a private personal communication was made with the physician. For both physicians involved in this study, the percentage of patients counseled to quit smoking rose after each feedback session. Although physicians may adequately learn antismoking interventions with training, these two studies show that their application of such skills may decline with time and their own modifications of the interven-

tions, two sources of variability that are potentially controllable with regular feedback sessions. Ewart et al. (1983) suggest that experimental designs include collecting continuous time series data that can be analyzed for individual and group performance trends. Such analyses will also provide a means of testing the generalizability of these findings.

Conclusions

Recommendations for Physicians

Patients, particularly those who are not experiencing life and death decisions in which continuation of smoking is relevant, find it difficult to comply with their physicians' advice to quit. Griffiths has observed, however, "Physicians frequently get discouraged with their rate of success, about one out of five, in helping patients to stop smoking. They forget, however, that their rate of success in curing lung cancer is much lower" (Griffiths 1981). As we have seen, a 20 percent cure rate would indeed be high for a truly minimal intervention. What are some of the actions that the physician who is interested in preventive action can take to assist his or her patients to stop smoking?

Some suggestions come from a theoretical formulation known as the Health Belief Model (Becker 1974, 1976; Becker et al. 1979). According to the model, the following elements are hypothesized to determine behavior: the individual's readiness to take action, determined by perceived susceptibility to the illness and perceived severity of the consequences of the illness; the individual's evaluation of the feasibility and efficacy of health behavior; the individual's evaluation of barriers to the health behavior; and a cue to action that triggers the behavior. On several of these elements, patients who are experiencing respiratory and cardiac problems have much more clearly defined reasons to be compliant with the request to quit smoking than patients seen in general practice. Thus, they would be seen as having stronger health beliefs. Women who are pregnant fall somewhere in between, depending on just how harmful they perceive their smoking to be to themselves and the fetus (Dalton et al. 1981). The clinician may succeed in motivating the members of the latter two groups by intensifying the message. Support for this position is found in studies that have compared more intense with less intense advice (Burt 1974; Ockene et al. 1982b; Raw 1976; Rose 1977).

Other models with a more social learning and social psychological orientation pose as central concepts the belief in personal control (Bandura 1973) and the need for relearning to change the conditioned emotional schema that contribute to maintaining smoking (Leventhal and Cleary 1980). Social support has also been raised as an important theoretical variable (Ockene et al. 1982a; USDHHS

1980). Practical applications of such approaches might be assessing and bolstering the self-confidence of a patient wishing to quit smoking and involving a spouse in the cessation effort.

The physician's message must be tempered with other factors, such as the strength of already existing beliefs and the mechanisms for continued smoking. Work by Leventhal (1968, 1970) on the communication of fear messages suggests that such messages may interfere with adoption of a recommended health-facilitating behavior. For example, he found that smokers are less likely to undergo a chest X-ray after viewing a filmed lung cancer operation than smokers who do not view the film, because the experience produces an increased fear that interferes with the goal of the advice. The extent of the interference is probably related to the purpose that smoking serves for the person (whether it is arousal reducing or habitual).

Physicians should also appreciate the importance of both physiological and personality variables that lead to the initiation and maintenance of smoking (USDHEW 1979; USDHHS 1982). Likewise, they should consider both the habitual and the addictive components of smoking behavior and the consequent difficulty in producing extinction (APA 1980; NIDA 1979). When these factors are considered, it is not surprising that a brief warning to a "healthy" patient is not effective. In this context, "healthy" relates to the lack of current major symptoms that the smoker relates to smoking.

Physicians do not need to assume full responsibility for helping patients quit smoking, however. Lichtenstein and Danaher's (1978) model suggests that the physician can become involved with patients at a variety of levels, although Wilson et al. (1982) indicate that continuing contact with the patient can be useful. Chu and Day (1981), Ewart et al. (1983), and Spencer (1983) have shown that awareness of smoking and providing antismoking materials for clinical use can motivate physicians toward increased effort with smoking patients. Wechsler et al. (1983) found that 81 percent of primary care physicians surveyed personally provided patient education as opposed to having a nurse or other health professional deliver it. They were more likely to want to learn about a specific area (e.g., smoking cessation techniques) in CME classes if they believed in the importance of changing behavior in that area and had confidence in their chances of success in helping patients. Thus, physician self-efficacy is an important concept in delivering smoking cessation advice. The most valuable types of assistance identified by the physicians in this study were information on referral sources, financial reimbursement for health-promotion services and staffing, literature for distribution to patients, and training for physicians, support staff, or both. The direct provider role, as well as other roles for the physician (such as referral to treatment), has been described,

and practical guides that cover the physician's involvement on a number of levels do exist (Pechacek and Grimm 1983; Shipley and Orleans 1982). Smoking cessation materials prepared especially for the physician are available from the National Cancer Institute—the Helping Smokers Quit Kit—and from the American Cancer Society—the Physician's Help Quit Kit. These kits have not yet been formally evaluated for efficacy.

Future Research

A number of salient issues for future research in the area of physician intervention emerge from this review. First of all, the interventions that will work best for physician providers have yet to be identified. For example, is a minimal intervention like simple advice to quit the optimal use of a physician's time, or can physicians successfully integrate a multicomponent or multistage intervention into their practice and achieve substantially higher quit rates? What techniques supplementary to physician advice will yield maximum return in cessation? What are the differential effects of advice alone and of the offer of treatment on the likelihood of cessation? How does one improve the communication skills of physicians practicing health education with patients?

Second, will different interventions work best for different patients classified according to disease status? Will tailoring treatments according to patient group or to individual patient characteristics be useful (Best 1975; Best and Steffy 1975; Eiser 1982)? Can the physician employ a sequential model of smoking behavior (Prochaska and DiClemente 1983) so that interventions can be staged according to the patient's readiness to quit smoking?

Third, what kind of training in smoking cessation will be most effective for physicians? Training formats range from noninteractive materials such as printed matter and audio or video cassettes to formal programs such as CME classes or other instructor-led workshops or programs. Should role modeling and direct practice under supervision be used to help teach skills? What educational (or other) efforts will be needed to sustain physician counseling efforts and success?

Fourth, what are the variables controlling differential success rates among physicians? Are they personal variables, like smoking status (American Cancer Society 1981; Danaher 1978), or training-influenced performance factors such as consistency of applied effort over time (Ewart et al. 1983)? How can physician motivation to counsel patients be increased and maintained? How can physicians best be delivered feedback about their counseling performance as well as the efficacy of their efforts?

Fifth, future research needs to pay closer attention to methodological considerations that will facilitate testing hypotheses and evaluat-

ing outcomes. These have been summarized earlier and involve design considerations, assignment of patients to groups, followup of outcome, and objective verification of self-report.

Sufficient evidence has been presented here to support an effective role for the physician, as the leading and most credible figure in the health care world, in smoking cessation efforts. As Cullen and Gritz (1983) stated, "The most effective technique to be employed, as well as when and with what specific group, can await further research. But given the importance of smoking as the most potent, preventable pathogen still responsible for a substantial amount of premature mortality, morbidity, and health care costs, there is no longer an excuse for physicians to leave this effort solely to other health professionals" (p. 224).

Summary and Conclusions

1. At least 70 percent of North Americans see a physician once a year. Thus, an estimated 38 million of the 54 million adults in the United States who smoke cigarettes could be reached annually with a smoking cessation message by their physician.
2. Current smoking prevalence among physicians in the United States is estimated at 10 percent.
3. While the majority of persons who smoke feel that physician advice to quit or cut down would be influential, there is a disparity between physicians' and patients' estimates of cessation counseling, with physician advice being reported by only approximately 25 percent of current smokers.
4. Studies of routine (minimal) advice to quit smoking delivered by general practitioners have shown sustained quit rates of approximately 5 percent. Followup discussions enhance the effects of physician advice.
5. A median of 20 percent of pregnant women who smoke quit spontaneously during pregnancy. That proportion can be doubled by an intervention consisting of health education, behavioral strategies, and multiple contacts.
6. Large controlled trials of cardiovascular risk reduction have demonstrated that counseling on individual specific risk factors, including smoking cessation techniques, can be effective.
7. Studies of pulmonary and cardiac patients indicate that severity of illness is positively related to increased compliance in smoking cessation. Survivors of a myocardial infarction have smoking cessation rates averaging 50 percent.
8. Nicotine chewing gum has been developed as a pharmacological aid to smoking cessation, primarily to alleviate withdrawal symptoms. Cessation studies conducted in offices of physicians who prescribe the gum have produced mixed results, however,

with outcome depending on motivation and intensity of adjunctive support or followup.

9. Physician-assisted intervention quit rates vary according to the type of intervention, provider performance, and patient group. In general, quit rates in recent research appear to be lower than in older studies.

References

ALLAIRE, J.J. How you can help your patients to stop smoking. *Medical Times* 111(7): 42–47, 1983.

AMERICAN CANCER SOCIETY. *A Survey Concerning Cigarette Smoking, Health Check-ups, Cancer Detection Tests. A Summary of the Findings.* New York, American Cancer Society, 1977.

AMERICAN CANCER SOCIETY. The impact of providing physicians with quit-smoking materials for smoking patients. *CA–A Cancer Journal for Clinicians* 31: 75–78, 1981.

AMERICAN PSYCHIATRIC ASSOCIATION. *Diagnostic and Statistical Manual of Mental Disorders.* (Third Edition). Washington, D.C., American Psychiatric Association, 1980.

BAILE, W.F., BIGELOW, G.E., GOTTLIEB, S.H., STITZER, M.L., SACKTOR, J.D. Rapid resumption of cigarette smoking following myocardial infarction: Inverse relationship to myocardial infarction severity. *Addictive Behaviors* 7: 373–380, 1982.

BAKER, T.R., OSCHERWITZ, M., CORLIN, R., JARBOE, T., TEISCH, J., NICHAMAN, M.Z. Screening and treatment program for mild chronic obstructive pulmonary disease. *Journal of the American Medical Association* 214(8): 1448–1455, November 23, 1970.

BALL, K., TURNER, R. Smoking and the heart: The basis for action. *Lancet* 2(7884): 822–826, October 5, 1974.

BANDURA, A. The self-efficacy: Toward a unifying theory of behavior change. *Psychological Review* 84: 191–215, 1973.

BARIC, L., MACARTHUR, C., SHERWOOD, M. A study of health education aspects of smoking in pregnancy. *International Journal of Health Education* 19(2/Supplement): 1–17, April-June, 1976.

BATTISTA, R.N. Adult cancer prevention in primary care: Patterns of practice in Quebec. *American Journal of Public Health* 73(9): 1036–1039, 1983.

BATTISTA, R.N, SPITZER, W.O. Adult cancer prevention in primary care: Contrasts among primary care practice settings in Quebec. *American Journal of Public Health* 73(9): 1040–1041, 1983.

BAUMAN, K.E., BRYAN, E.S., DENT, C.W., KOCH, G.G. The influence of observing carbon monoxide level on cigarette smoking by public prenatal patients. *American Journal of Public Health* 73(9): 1089–1091, September 1983.

BECKER, M.H. The health belief model and sick role behavior. *Health Education Monographs* 2(4): 409–419, Winter 1974.

BECKER, M.H. Sociobehavioral determinants of compliance. In: Sackett, D.L., Haynes, R.B. (Editors). *Compliance With Therapeutic Regimens.* Baltimore, Johns Hopkins University Press, 1976, pp. 40–50.

BECKER, M.H., MAIMAN, L.A., KIRSCHT, J.P., HAEFNER, D.P., DRACHMAN, R.H., TAYLOR, D.W. Patient perceptions and compliance: Recent studies of the Health Belief Model. In: Taylor, D.W., Sackett, D.L. (Editors). *Compliance in Health Care.* Baltimore, Johns Hopkins University Press, 1979, pp. 78–109.

BEST, J.A. Tailoring smoking withdrawal procedures to personality and motivational differences. *Journal of Consulting and Clinical Psychology* 43(1): 1–8, February 1975.

BEST, J.A. Stopping smoking by finding alternatives. *Continuing Education for the Family Physician* 9(1): 36–37, 41, 44–45, July 1978.

BEST, J.A., STEFFY, R.A. Smoking modification procedures for internal and external locus of control clients. *Canadian Journal of Behavioral Science* 7(2): 155–165, April 1975.

BOHM, E., POWELL, D.R. A ten point practical program to help your smokers quit. *Your Patient and Cancer,* November 1982, pp. 1–9.

480-144 O - 85 - 17

BRANTMARK, B., OHLIN, P., WESTLING, H. Nicotine-containing chewing gum as an antismoking aid. *Psychopharmacologia* 31: 191–200, 1973.

BRITISH THORACIC SOCIETY. Comparison of four methods of smoking withdrawal in patients with smoking related diseases. *British Medical Journal* 286(6366): 595–597, February 19, 1983.

BROOK, R.H., WARE, J.E., Jr., ROBERS, W.H., KEELER, E.B., DAVIES, A.R., DONALD, C.A., GOLDBERG, G.A., LOHR, K.N., MASTHAY, P.C., NEWHOUSE, J.P. Does free care improve adults' health? *New England Journal of Medicine* 309(23): 1426–1434, 1983.

BUIST, A.S., NAGY, J.M., SEXTON, G.J. The effect of smoking cessation on pulmonary function: A 30-month follow-up of two smoking cessation clinics. *American Review of Respiratory Disease* 120: 953–957, 1979.

BUIST, A.S., SEXTON, G.J., NAGY, J.M., ROSS, B.B. The effect of smoking cessation and modification on lung function. *American Review of Respiratory Disease* 114(1): 115–122, July 1976.

BURLING, T.A., BIGELOW, G.E., BAILE, W.F., GOTTLIEB, S.H. *Smoking Cessation Following Acute Myocardial Infarction.* Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Los Angeles, 1982.

BURLING, T.A., SINGLETON, E.G., BIGELOW, G.E., BAILE, W.F., GOTTLIEB, S.H. Smoking following myocardial infarction: A critical review of the literature. *Health Psychology* 3(1): 83–96, 1984.

BURNS, B.H. Chronic chest disease, personality and success in stopping cigarette smoking. *British Journal of Preventive and Social Medicine* 23(1): 23–27, February 1969.

BURNUM, J.F. Outlook for treating patients with self-destructive habits. *Annals of Internal Medicine* 81(3): 387–393, September 1974.

BURT, A., THORNLEY, P., ILLINGWORTH, D., WHITE, P., SHAW, T.R.D., TURNER, R. Stopping smoking after myocardial infarction. *Lancet* 1(7852): 304–306, February 23, 1974.

CAMPBELL, I.A. *Predictive Factors for Smoking Withdrawal in Patients.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

CHECK, W.A. Doctors, let's stop dragging (our feet). *Journal of the American Medical Association* 242(26): 283–282, December 1979.

CHU, F.Z., DAY, R.G. Smoking recognition by family physicians. *Journal of Family Practice* 12(4): 657–660, April 1981.

COOPER, R., SOLTERO, I., STAMLER, J., MOJONNIER, L., HALL, Y., MOSS, D., BERKSON, D.M., TOKICH, T. Smoking cessation in the Chicago Coronary Prevention Evaluation Program. *Journal of the National Medical Association* 74(4): 349–355, April 1982.

COOPERSTOCK, R., THOM, B. Health, smoking and doctors' advice. *Journal of the Royal College of General Practitioners* 32(236): 174–178, March 1982.

CROOG, S.H., RICHARDS, N.P. Health beliefs and smoking patterns in heart patients and their wives: A longitudinal study. *American Journal of Public Health* 67(10): 921–930, October 1977.

CULLEN, J.W., GRITZ, E.R. Behavior modification for cancer prevention. In: Newell, G.R. (Editor). *Cancer Prevention in Clinical Medicine.* New York, Raven Press, 1983, pp. 209–229.

DALTON, E.R., HUGHES, C.A., COGSWELL, J.J. Cigarette smoking in pregnancy: A health education problem. *Public Health* (London) 95: 207–214, 1981.

DANAHER, B.G. OB-GYN intervention in helping smokers quit. In: Schwartz, J.L. (Editor). *Progress in Smoking Cessation.* International Conference on Smoking Cessation, June 21–23, 1978. New York, American Cancer Society, 1978, pp. 316–328.

DANAHER, B.G., ELLIS, B.H., FARQUHAR, J.W. How to help smokers who want to quit. *Patient Care* 14(14): 86–121, August 15, 1980.

DANAHER, B.G., SHISSLAK, C.M., THOMPSON, C.B., FORD, J.D. A smoking cessation program for pregnant women: An exploratory study. *American Journal of Public Health* 68(9): 896–898, September 1978.

DAUGHTON, D.M., FIX, A.J., KASS, I., PATIL, K.D. Smoking cessation among patients with chronic obstructive pulmonary disease (COPD). *Addictive Behaviors* 5(2): 125–128, 1980.

DAVISON, G., DUFFY, M. Smoking habits of long-term survivors of surgery for lung cancer. *Thorax* 37(5): 331–333, May 1982.

DENSON, R., NANSON, J.L., McWATTERS, M.D. Hyperkinesis and maternal smoking. *Canadian Psychiatric Association Journal* 20(3): 181–187, April 1975.

DONOVAN, J.W. Randomized controlled trial of anti-smoking advice in pregnancy. *British Journal of Preventive and Social Medicine* 31: 6–12, 1977.

DONOVAN, J.W., BURGESS, P.L., HOSSACK, C.M., YUDKIN, G.D. Routine advice against smoking in pregnancy. *Journal of the Royal College of General Practitioners* 25: 264–268, 1975.

DUDLEY, P.L., AICKIN, M., MARTIN, C.J. Cigarette smoking in a chest clinic population: Psychophysiologic variables. *Journal of Psychosomatic Research* 21: 367–375, 1977.

EISER, J.R. Addiction as attribution: Cognitive processes in giving up smoking. In: Eiser, J.R. (Editor). *Social Psychology and Behavioral Medicine* New York, John Wiley and Sons, 1982, pp. 281–299.

ENSTROM, J.R. Trends in mortality among California physicians after giving up smoking: 1950-79. *British Medical Journal* 286: 1101–1105, 1983.

EWART, C.K., LI, V.C., COATES, T.J. Increasing physicians' antismoking influence by applying an inexpensive feedback technique. *Journal of Medical Education* 58(6): 468–473, June 1983.

FAGERSTRÖM, K.-O. A comparison of psychological and pharmacological treatment in smoking cessation. *Journal of Behavioral Medicine* 5(3): 343–351, September 1982.

FAGERSTRÖM, K.-O. *Effects of Nicotine Chewing Gum and Follow-up Appointments in Physician-Based Smoking Cessation.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

FEE, W.M., STEWART, M.J. A controlled trial of nicotine chewing gum in a smoking withdrawal clinic. *Practitioner* 226(1363): 148–151, January 1982.

FIELDING, J.E., YANKAUER, A. The pregnant smoker. *American Journal of Public Health* 68(9): 835–836, September 1978.

FLETCHER, C., DOLL, R. A survey of doctors' attitudes to smoking. *British Journal of Preventive and Social Medicine* 23: 145–153, 1969.

FOWLER, G. Smoking. In: Gray, M., Fowler, G.H. (Editors). *Preventive Medicine in General Practice.* Oxford, Oxford University Press, 1983, pp. 133–148.

FOWLER, G., JAMROZIK, K. *The "Beliefs" and "Activities" of G.P.'s and Health Visitors About Anti-smoking Education.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

FRIED, P.A., WATKINSON, B., GRANT, A., KNIGHTS, R.M. Changing patterns of soft drug use prior to and during pregnancy: A prospective study. *Drug and Alcohol Dependence* 6(5): 323–343, November 1980.

GARFINKEL, L. Cigarette smoking among physicians and other health professionals, 1959-1972. *CA–A Cancer Journal for Clinicians* 26(6): 373–375, November-December 1976.

GASTRIN, G. *Smoke-Free Pregnancy: Smoking Cessation as an Integral Part of Prenatal Health Care.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

GRABOWSKI, J., HALL, S. (Editors). *Pharmacologic Adjuncts in the Treatment of Tobacco Dependence*. NIDA Research Monograph. U.S. Government Printing Office, in press.

GREEN, D.E., HORN, D. Physician's attitude toward their involvement in smoking problems of patients. *Diseases of the Chest* 54(3): 180–181, September 1968.

GRIFFITHS, W. Can human behavior be modified? *Cancer* 47(Supplement, 5): 1221–1225, March 1, 1981.

GUZMAN, C. Quit smoking rate in the Ottawa out-patient rehabilitation programme for patients with chronic lung disease. (Personal communication, 1978).

HACKETT, D.R. Smoking habits during pregnancy. *Irish Medical Journal* 72(11): 483–486, November 30, 1979.

HALHUBER, C. Stop smoking training in patients with coronary heart disease. In: Hauss, W.H., Wissler, R.W., Lehmann, R. (Editors). *International Symposium: State of Prevention and Therapy in Human Arteriosclerosis*. Opladen, Westdeutscher Verlag, 1978, pp. 493–498.

HALL, S.M., BACHMAN, J., HENDERSON, J.B., BARSTOW, R., JONES, R.T. Smoking cessation in patients with cardiopulmonary disease: An initial study. *Addictive Behaviors* 8(1): 33–42, 1983.

HAMMOND, E.C. Evidence on the effects of giving up cigarette smoking. *American Journal of Public Health* 55(5): 682–691, May 1965.

HAMMOND, E.C. Smoking in relation to the death rates of one million men and women. In: Haenszel, W. (Editor). *Epidemiological Approaches to the Study of Cancer and Other Chronic Diseases*. National Cancer Institute Monograph 19. U.S. Department of Health, Education, and Welfare, Public Health Service, National Cancer Institute, January 1966, pp. 127–204.

HANDEL, S. Change in smoking habits in a general practice. *Post Graduate Medical Journal* 49: 679–681, October 1973.

HARRIS, J.E. *Smoking During Pregnancy: Preliminary Results From the National Clearinghouse on Smoking and Health: 1975 Prevalence Data*. September 1979.

HAY, D.R., TURBOTT, S. Changes in smoking habits in men under 65 years after myocardial infarction and coronary insufficiency. *British Heart Journal* 32: 738–740, 1970.

HICKEY, N., MULCAHY, R., DALY, L., GRAHAM, I, O'DONOGHUE, S., KENNEDY, C. Cigar and pipe smoking related to four year survival of coronary patients. *British Heart Journal* 49(5): 423–426, 1983.

HJALMARSON, A.I.M. *The Effect of Nicotine Chewing Gum in Smoking Cessation: A Randomized, Placebo-Controlled, Double-Blind Study*. Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

HOCHBAUM, G.M. Fear is not enough. *American Lung Association Bulletin* 61(5): 13–16, June 1975.

HUBERT, H.B., HOLFORD, T.R., KANNEL, W.B. Clinical characteristics and cigarette smoking in relation to prognosis of angina pectoris in Framingham. *American Journal of Epidemiology* 115(2): 231–242, February 1982.

HUGHES, J.R., EPSTEIN, L.F., ANDRASIK, F., NEFF, D.F., THOMPSON, D.S. Smoking and carbon monoxide levels during pregnancy. *Addictive Behaviors* 7:271–276, 1982.

HUGHES, J.R., HATSUKAMI, D.K., PICKENS, R.W., KRAHN, D., MALIN, S., LUKNIC, A. Effect of nicotine gum on the tobacco withdrawal syndrome. *Psychopharmacologia* 83(1): 82–87, April 1984.

HUGHES, J.R., MILLER, S.A. *Nicotine Gum as an Aid to Smoking Cessation*. Unpublished manuscript.

HYMOWITZ, N. The practicing physician and smoking cessation. *Journal of the Medical Society of New Jersey* 74(2): 139–141, February 1977.

INDYKE, D., ELLIS, B.H. There's a leading role for physicians in helping smokers to quit. *American Lung Association Bulletin* 66(2): 2–6, March 1980.

JARVIS, M. *The Use of Nicotine Chewing Gum in a Smokers' Clinic.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983.

JARVIS, M.J., RAW, M., RUSSELL, M.A.H., FEYERABEND, C. Randomised controlled trial of nicotine chewing gum. *British Medical Journal* 285(6341): 537–540, August 21, 1982.

JARVIS, M.J., RUSSELL, M.A.H. Smoking withdrawal in patients with smoking related diseases. (Letter). *British Medical Journal* 286(6369): 976–977, March 19, 1983.

KING, J., EISER, J.R. A strategy for counselling pregnant smokers. *Health Education Journal* 4(3): 66–68, 1981.

KIRK, C.J.C., LUND, V.J., WOOLCOCK, N.E., GREENHALGH, R.M. The effect of advice to stop smoking on arterial disease patients, assessed by serum thiocyanate levels. *Journal of Cardiovascular Surgery* 21(5): 568–569, September-October 1980.

KOHN, R., WHITE, K.L. (Editors). *Health Care: An International Study.* Report of the World Health Organization/International Collaborative Study of Medical Care Utilization. London, Oxford University Press, 1976, 557 pp.

KORNFELD, D.S., HELLER, S.S., FRANK, K.A., WILSON, S.N., MALM, J.R. Psychological and behavioral responses after coronary artery bypass surgery. *Circulation* 66(5, Part II): III-24–II-28, November 1982.

KRETZSCHMAR, R.M. Smoking and health: The role of the obstetrician and gynecologist. *Obstetrics and Gynecology* 55(4): 403–406, April 1980.

KULLER, L., MEILAHN, E., TOWNSEND, M., WEINBERG, G. Control of cigarette smoking from a medical perspective. In: Breslow, L., Fielding, J.E., Lave, L.B. (Editors). *Annual Review of Public Health,* Volume 3. Palo Alto, Annual Reviews Inc., 1982, pp. 153–178.

LANDESMAN-DWYER, S., EMANUEL, I. Smoking during pregnancy. *Teratology* 19(1): 119–125, February 1979.

LEVENTHAL, H. Experimental studies of anti-smoking communications. In: Borgatta, E.F., Evans, R.R. (Editors). *Smoking, Health and Behavior.* Chicago, Aldine Publishing Company, 1968, pp. 95–121.

LEVENTHAL, H. Findings and theory in the study of fear communications. *Advances in Experimental Social Psychology* 5: 120–181, 1970.

LEVENTHAL, H., CLEARY, P.D. The smoking problem: A review of the research and theory in behavioral risk modification. *Psychological Bulletin* 88(2): 370–405, 1980.

LICHTENSTEIN, E., DANAHER, B.G. What can the physician do to assist the patient to stop smoking? In: Brashear, R.E., Rhoades, M.L. (Editors). *Chronic Obstructive Lung Disease: Clinical Treatment and Management.* St. Louis, Mosby, 1978, pp. 227–241.

LLOYD, G.G., CAWLEY, R.H. Smoking habits after myocardial infarction. *Journal of the Royal College of Physicians of London* 14(4): 224–226, October, 1980.

LUBAN-PLOZZA, B. The treatment of smoking from the point of view of a general clinic. In: Steinfeld, J., Griffiths, W., Ball, K., Taylor, R.M. (Editors). *Health Consequences, Education, Cessation Activities, and Governmental Action.* Proceedings of the Third World Conference on Smoking and Health, New York, June 2–5, 1975. Volume 2. U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH)77-1413, 1977, pp. 683–687.

MALCOLM, R.E., SILLETT, R.W., TURNER, J.A.M., BALL, K.P. The use of nicotine chewing gum as an aid to stopping smoking. *Psychopharmacology* 70(3): 295–296, 1980.

MALLAGHAN, M., PEMBERTON, J. Some behavioral changes in 493 patients after an acute myocardial infarction. *British Journal of Preventive and Social Medicine* 31(2): 86–90, June 1977.

MALOTTE, C.K., FIELDING, J.E., DANAHER, B.G. Description and evaluation of the smoking cessation component of a multiple risk factor intervention program. *American Journal of Public Health* 71(8): 844–847, August 1981.

MAUSNER, J.S. Cigarette smoking among patients with respiratory disease. *American Review of Respiratory Disease* 102(5): 704–713, November 1970.

MAUSNER, J.S. MAUSNER, B., RIAL, W.Y. The influence of a physician on the smoking behavior of his patients. *American Journal of Public Health* 58(1): 46–53, January 1968.

MAYOU, R., FOSTER, A., WILLIAMSON, B. Psychosocial adjustment in patients one year after myocardial infarction. *Journal of Psychosomatic Research* 22(5): 447–453, 1978.

McNABB, M.E., EBERT, R.V., McCUSKER, K. Plasma nicotine levels produced by chewing nicotine gum. *Journal of the American Medical Association* 248(7): 865–868, August 20, 1982.

MEYER, A.J., HENDERSON, J.B. Multiple risk factor reduction in the prevention of cardiovascular disease. *Preventive Medicine* 3(2): 225–236, June 1974.

MULCAHY, R., HICKEY, N., GRAHAM, I.M., MacAIRT, J. Factors affecting the 5 year survival rate of men following acute coronary heart disease. *American Heart Journal* 93(5): 556–559, May 1977.

MULCAHY, R., HICKEY, N., GRAHAM, I.M., McKENZIE, G. Factors influencing long-term prognosis in male patients surviving a first coronary attack. *British Heart Journal* 37(2): 158–165 February, 1975.

NATIONAL CENTER FOR HEALTH SERVICES RESEARCH, 1983. *National Health Care Expenditures Study–Data Preview.* DHHS Publication No. (PHS)83–3361.

NATIONAL CENTER FOR HEALTH STATISTICS. *Current Estimates From the National Health Interview Survey: United States, 1981.* Vital and Health Statistics, Series 10, No. 141, DHHS Publication No. (PHS)82-1569, October 1982. 106 pp.

NATIONAL INSTITUTE ON DRUG ABUSE. *Cigarette Smoking as a Dependence Process.* Krasnegor, N.A. (Editor). NIDA Research Monograph 23. Department of Health, Education, and Welfare. DHEW Publication No. (ADM)79–800, January 1979.

OCKENE, J.K., BENFARI, R.C., NUTTALL, R.L., HURWITZ, I., OCKENE, J.S. Relationship of psychosocial factors to smoking behavior change in an intervention program. *Prevention Medicine* 11(1): 13–28, January 1982a.

OCKENE, J.K., HYMOWITZ, N., SEXTON, M., BROSTE, S.K. Comparison of patterns of smoking behavior change among smokers in the Multiple Risk Factor Intervention Trial (MRFIT). *Preventive Medicine* 11(6): 621–638, November 1982b.

PACIFIC MUTUAL LIFE INSURANCE COMPANY. *News Information* Pacific Mutual Life Insurance Company, November 1978.

PEABODY, H.D., Jr. A practical approach to the office management of cessation of cigarette smoking. In: Richardson, R.G. (Editor.) *The Second World Conference on Smoking and Health.* The proceedings of a conference organized by the Health Education Council, Imperial College, London, September 20-24, 1971. London, Pitman Medical, 1972, pp. 185–189.

PECHACEK, T.F., GRIMM, R.H., Jr. Cigarette smoking and the prevention of coronary heart disease. In: Podell, R., Stewart, M. (Editors). *Primary Prevention of Coronary Heart Disease: A Practical Guide for the Clinician.* Menlo Park, California: Addison-Wesley, 1983, pp. 34–77.

PECHACEK, T.F., McALISTER, A.L. Strategies for the modification of smoking behavior: Treatment and prevention. In: Ferguson, J.M., Taylor, C.B. (Editors). *Extended Applications and Issues.* The Comprehensive Handbook of Behavioral Medicine, Volume 3, Jamaica, New York, Spectrum Publications, 1980, pp. 257–298.

PEDERSON, L.L. Compliance with physician advice to quit smoking: A review of the literature. *Preventive Medicine* 11(1): 71–84, January 1982.

PEDERSON, L.L., BASKERVILLE, J.C. Multivariate prediction of smoking cessation following physician advice to quit smoking: A validation study. *Preventive Medicine* 12(3): 430–436, May 1983.

PEDERSON, L.L., BASKERVILLE, J.C., WANKLIN, J.M. Multivariate statistical models for predicting change in smoking behavior following physician advice to quit smoking. *Preventive Medicine* 11(5): 536–549, September 1982.

PEDERSON, L.L., WILLIAMS, J.I., LEFCOE, N.M. Smoking cessation among pulmonary patients as related to type of respiratory disease and demographic variables. *Canadian Journal of Public Health* 71(3): 191–194, May-June, 1980.

PENTECOST, B.L., Preventing the second infarct. *Journal of the Royal College of Physicians of London* 14(1): 22–25, January 1980.

PETERSON, D.I., LONERGAN, L.H., HARDINGE, M.G. Smoking and pulmonary function. *Archives of Environmental Health* 16(2): 215–218, February 1968.

PINCHERLE, G., WRIGHT, H.B. Smoking habits of business executives: Doctor variation in reducing cigarette consumption. *Practitioner* 205(1226): 209–212, August 1970.

POMERLEAU, O. You can get patients to change their habits. *Medical Times* 104(10): 149–158, October 1976.

PORTER, A.M.W., McCULLOUGH, D.M. Counselling against cigarette smoking. A controlled study from a general practice. *Practitioner* 209(1253): 686–689, November 1972.

POWELL, D.R., ARNOLD, C.B. Antismoking program for coronary prone men. An evaluation study. *New York State Journal of Medicine* 82(10): 1435–1438, September 1982.

PROCHASKA, J.O., DiCLEMENTE, C.C. Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology* 51(3): 390–395, June 1983.

PUSKA, P., BJORKQVIST, S., KOSKELA, K. Nicotine-containing chewing gum in smoking cessation: A double blind trial with half year follow-up. *Addictive Behaviors* 4(2): 141–146, 1979.

RAHE, R.H., WARD, H.W., HAYES, V. Brief group therapy in myocardial infarction rehabilitation: Three-to-four-year follow up of a controlled trial. *Psychosomatic Medicine* 41(3): 229–242, May 1979.

RAW, M. Persuading people to stop smoking. *Behavior Research and Therapy* 14(2): 97–101, 1976.

RAW, M., JARVIS, M.J., FEYERABEND, C., RUSSELL, M.A.H. Comparison of nicotine chewing-gum and psychological treatments for dependent smokers. *British Medical Journal* 281(6238): 481–482, August, 16 1980.

RICHMOND, H.W. A fifteen-year prospective study of the incidence of coronary heart disease related to cigarette smoking habits in Cummins Engine Company management personnel with results of a vigorous anti-smoking education campaign. In: Steinfeld, J., Griffith, W., Ball, K., Taylor, R.M. (Editors). *Health Consequences, Education, Cessation Activities, and Governmental Action.* Proceedings of the Third World Conference on Smoking and Health, New York, June 2–5, 1975, Volume 2. U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH)77-1413, 1977, pp. 275–281.

RONAN, G., RUANE, P., GRAHAM, I.M., HICKEY, N., MULCAHY, R. The reliability of smoking history amongst survivors of myocardial infarction. *British Journal of Addiction* 76(4): 425–428, December 1981.

ROSE, G. Smoking cessation in high-risk subjects. *Health Magazine* 12(4): 19–22, Winter 1975-1976.

ROSE, G. Physician counseling and personal intervention. In: Steinfeld, J., Griffith, W., Ball, K., Taylor, R.M. (Editors). *Health Consequences, Education, Cessation Activities, and Governmental Action.* Proceedings of the Third World Conference on Smoking and Health, New York, June 2–5, 1975, Volume 2. U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Cancer Institute, DHEW Publication No. (NIH)77-1413, 1977, pp. 515–523.

ROSE, G., HAMILTON, P.J.S. A randomized controlled trial of the effect on middle-aged men of advice to stop smoking. *Journal of Epidemiology and Community Health* 32(4): 275–281, December 1978.

ROSE, G., HAMILTON, P.J.S., COLWELL, L., SHIPLEY, M.J. A randomised controlled trial of anti-smoking advice: 10-year results. *Journal of Epidemiology and Community Health* 36(2): 102–108, June 1982.

ROSE, G., HELLER, R.F., PEDOE, H.T., CHRISTIE, D.G.S. Heart disease prevention: A randomised controlled trial in industry. *British Medical Journal* 280(6216): 747–751, March 15, 1980.

ROSE, G., UDECHUKU, J.C. Cigarette smoking by hospital patients. *British Journal of Preventive and Social Medicine* 25(3): 160–161, August 1971.

ROSEN, C., ASHLEY, M.J. Smoking and the health professional: Recognition and performance of roles. *Canadian Journal of Public Health* 69(5): 399–406, September-October 1978.

ROSSER, W.W. Helping patients to stop smoking. The current situation. *Canadian Family Physician* 23: 101–105, 1977.

ROSSER, W.W. Ways of helping patients to stop smoking. *Canadian Family Physician* 25: 923–926, August 1979.

RUSSELL, M.A.H. Cigarette dependence: II. Doctor's role in management. *British Medical Journal* 2(5758) 393–395, May 15, 1971.

RUSSELL, M.A.H., FEYERABEND, C., COLE, P.V. Plasma nicotine levels after cigarette smoking and chewing nicotine gum. *British Medical Journal* 1: 1043–1046, 1976a.

RUSSELL, M.A.H., MERRIMAN, R., EDWARDS, A.R. *Minimal Anti-Smoking Intervention by Physicians and its Enhancement by Nicotine Chewing Gum.* Paper presented at the Fifth World Conference on Smoking and Health, Winnipeg, Canada, July 1983a.

RUSSELL, M.A.H., MERRIMAN, R., STAPLETON, J., TAYLOR, W. Effect of nicotine chewing gum as an adjunct to general practitioners' advice against smoking *British Medical Journal* 287(6407): 1782–1785, December 10, 1983b.

RUSSELL, M.A.H., RAW, M., JARVIS, M.J. Clinical use of nicotine chewing-gum. *British Medical Journal* 280(6231): 1599–1602, June 28, 1980.

RUSSELL, M.A.H., WILSON, C., FEYERABEND, C., COLE, P.V. Effect of nicotine chewing gum on smoking behaviour and as an aid to cigarette withdrawal. *British Medical Journal* 2(6032): 391–393, August 14, 1976b.

RUSSELL, M.A.H., WILSON, C., TAYLOR, C., BAKER, C.D. Effect of general practitioners' advice against smoking. *British Medical Journal* 2(6184): 231–235, July 28, 1979.

RUSSELL, M.A.H., WILSON, C., TAYLOR, C., BAKER, C.D. Smoking prevalence among general practitioners' patients. *British Journal of Addictions* 75(4): 367–373, July 5, 1980.

SACHS, D.P.L. Smoking habits of pulmonary physicians. (Letter). *New England Journal of Medicine* 309(13): 799, 1983.

SALONEN, J.T. Stopping smoking and long-term mortality after acute myocardial infarction. *British Heart Journal* 43: 463–469, 1980.

SCHNEIDER, N.G., JARVIK, M.E. Time course of smoking withdrawal symptoms as a function of nicotine replacement. *Psychopharmacology* 82: 143–144, 1984.

SCHNEIDER, N.G., JARVIK, M.E., FORSYTHE, A.B., READ, L.L., ELLIOTT, M.L., SCHWEIGER, A. Nicotine gum in smoking cessation: A placebo-controlled, double-blind trial. *Addictive Behaviors* 8: 253–261, 1983.

SCHUMAN, L.M. The benefits of cessation of smoking. *Chest* 59(4): 421–427, April 1971.

SECKER-WALKER, R.H., FLYNN, B.S. Importance of smoking cessation counseling. *Continuing Education for the Family Physician* 18(5): 449–453, May 1983.

SEXTON, M., HEBEL, R. A clinical trial of change in maternal smoking and its effect on birth weight. *Journal of the American Medical Association* 251(7): 911–915, 1984.

SHERIN, K. Smoking cessation: The physician's role. *Postgraduate Medicine* 72(3): 99–106 September 1982.

SHIPLEY, R.H., ORLEANS, C.S. Treatment of cigarette smoking. In: Boudewyns, P. A., Keefe, F. J. (Editors.) *Behavioral Medicine in General Medical Practice.* Menlo Park, California, Addison-Wesley, 1982, pp. 238–268.

SILLETT, R.W., WILSON, M.B., MALCOLM, R.E., BALL, K.P. Deception among smokers. *British Medical Journal* 2(6146): 1185–1186, October 28, 1978.

SIVARAJAN, E.S., NEWTON, K.M., ALMES, M.J., KEMPF, T.M., MANSFIELD, L.W., BRUCE, R.A. The patient after myocardial infarction. Limited effects of outpatient teaching and counseling after myocardial infarction: A controlled study. *Heart and Lung* 12(1): 65–73 January 1983.

SPARROW, D., DAWBER, T.R., COLTON, T. The influence of cigarette smoking on prognosis after a first myocardial infarction: A report from the Framingham Study. *Journal of Chronic Diseases* 31(6/7): 425–432, 1978.

SPENCER, J. *General Practitioners' Views of the "Give Up Smoking" (GUS) Kit.* London, The City and Hackney Health District, Health Education Service, 1983.

STEWART, A.L., BROOK, R.H., KANE, R.L. *Smoking.* Conceptualization and Measurement of Health Habits for Adults in the Health Insurance Study, Volume 1. Rand Publication Series R-2374/1-HEW. Santa Monica, Rand Corporation, 1979.

STEWART, P.J., ROSSER, W.W. The impact of routine advice on smoking cessation from family physicians. *Canadian Medical Association Journal* 126(9): 1051–1054, May 1, 1982.

TRAHAIR, R.C.S. Giving up cigarettes: 222 case studies. *Medical Journal of Australia* 1: 929–932, May 6, 1967.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequence of Smoking for Women: A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, 1980, 385 pp.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: The Changing Cigarette. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, DHHS Publication No. (PHS)81-50156, 1981, 269 pp.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking: Cancer. A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, DHHS Publication No. (PHS)82-50179, 1982, 341 pp.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES. *The Health Consequences of Smoking. Cardiovascular Disease: A Report of the Surgeon General.* U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health. DHHS Publication No. (PHS)84–50204, 1983, 378 pp.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Survey of Health Professionals, 1975.* U.S. Department of Health, Education, and Welfare, Public Health Service, Office on Smoking and Health, National Clearinghouse for Smoking and Health, Publication No. CDC 21-74–552(P), June 1976.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. *Smoking and Health: A Report of the Surgeon General.* U.S. Department of Health, Education, and Welfare, Public Health Service, Office of the Assistant Secretary for Health, Office on Smoking and Health, DHEW Publication No. (PHS)79-50066, 1979, 1136 pp.

U.S. PUBLIC HEALTH SERVICE. Smoking and pregnancy. *The Health Consequences of Smoking. A Report of the Surgeon General.* U.S. Department of Health, Education, and Welfare, Public Health Service, Health Services and Mental Health Administration. DHEW Publication No. (HSM)73-8704, 1973, pp. 99–149.

U.S. PUBLIC HEALTH SERVICE. *Adult Use of Tobacco, 1975.* U.S. Department of Health, Education, and Welfare, Public Health Service, Center for Disease Control, National Clearinghouse for Smoking and Health, June 1976.

WECHSLER, H., LEVINE, S., IDELSON, R.K., ROHMAN, M., TAYLOR, J.O. The physician's role in health promotion: A survey of primary-care practitioners. *New England Journal of Medicine* 308(2): 97–100, January 13, 1983.

WEINBLATT, E., SHAPIRO, S., FRANK, C.W. Changes in personal characteristics of men, over five years, following first diagnosis of coronary heart disease. *American Journal of Public Health* 61(4): 831–842, April 1971.

WEST, R.J., JARVIS, M.J., RUSSELL, M.A.H., CARRUTHERS, M.E., FEYERABEND, C. Effect of nicotine replacement in the cigarette withdrawal syndrome. *British Journal of Addiction* 79(2): 215–219, June 1984.

WILCOX, R.G., HUGHES, J., ROLAND, J. Verification of smoking history in patients after infarction using urinary nicotine and cotinine measures. *British Medical Journal* 2(6197): 1026–1028, October 23, 1979.

WILHELMSSON, C., VEDIN, J.A., ELMFELDT, D., TIBBLIN, G., WILHELMSEN, L. Smoking and myocardial infarction. *Lancet* 1(7904): 415–420, February 22, 1975.

WILLIAMS, H.O. Routine advice against smoking. A chest clinic pilot study. *Practitioner* 202(1211): 672–676, May 1969.

WILSON, D., WOOD, G., JOHNSTON, N., SICURELLA, J. Randomized clinical trial of supportive follow-up for cigarette smokers in a family practice. *Canadian Medical Association Journal* 126(2): 127–129, January 15, 1982.

WILSON, R.W. Cigarette smoking, disability days and respiratory condition. *Journal of Occupational Medicine* 15(3): 236–240, March 3, 1973.

WINDSOR, R.A., GREEN, L.W., ROSEMAN, J.M. Health promotion and maintenance for patients with chronic obstructive pulmonary disease: A review. *Journal of Chronic Diseases* 33(11/12): 5–12, 1979.

WORLD HEALTH ORGANIZATION. Smoking and disease: The evidence reviewed. *World Health Organization Chronicle* 29: 402–408, October 1975.

WORLD HEALTH ORGANIZATION EUROPEAN COLLABORATIVE GROUP. Multifactorial trial in the prevention of coronary heart disease: 2. Risk factor changes at two and four years. *European Heart Journal* 3(2): 184–190, April 1982.

YANKAUER, A. Public and private prevention. (Editorial.) *American Journal of Public Health* 73: 1032–1034, 1983.

CHAPTER 10. COMMUNITY STUDIES OF SMOKING CESSATION AND PREVENTION